Notes

Absorption Spectra of Quinones in Their Adsorbed State

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The formation of paramagnetic semiquinone radicals is supported by the absorption spectra of quinones in adsorbed state.

IT has been reported from ESR measurements that some paramagnetic chemical species, mainly semiquinone radical ions, are formed when various organic compounds, like olefins, aromatic hydrocarbons, quinones, hydroquinones, etc. are adsorbed on oxides of aluminia, silica, etc.[1-4]. Since semiquinone radical ions obtained from quinones absorb at longer wavelengths compared to the parent quinones[5], it was surmised that the above assumption may be tested by the measurement of absorption spectra of quinones in the adsorbed state. With this object in view various quinones were adsorbed from benzene solution on to microcrystalline aluminium oxide, and the absorption spectra measured in the microscopic crystal spectrophotometer[6] using oil immersion objective (paraffin oil being used as immersion liquid). It may be observed from Fig. 1 that all the quinones employed showed, absorption in the long wavelength side of the parent quinone. The semiquinone radical ion from chloranil has been found to absorb between 450 and 500 nm (ref. 7, 8). The band position in the adsorbed state appears near 500 nm. As the spectra of other semiquinone radicals were not available, a comparison could not be made. Similar results have been obtained with magnesium oxide as adsorbing base. But the spectra were not changed at all when zinc oxide was used as adsorbing base.

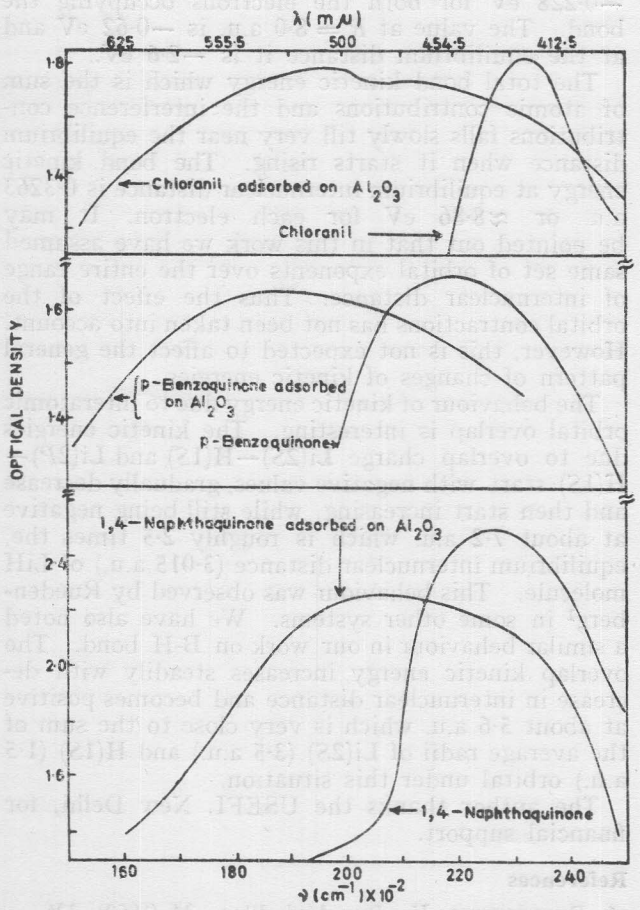

Fig. 1 Absorption spectra of the quinones adsorbed on alumina

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Kinetic Energy Changes During Formation of Li-H Bond

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The changes in the kinetic energy during the formation of LiH bond as the H atom gradually approaches Li, have been studied. It is found that the total kinetic energy of the localized molecular orbital corresponding to the bond falls off initially and then rises as the internuclear distance approaches the equilibrium internuclear distance. The kinetic energy due to orbital interference density, however, progressively falls off and thus contributes to the formation and stabilization of bonds. The kinetic energy due to interatomic orbital overlap also falls off initially and then rises up progressively.

MANY attempts have been made to study the various factors responsible for the formation of a chemical bond[1-12]. A quantitative analysis of the energetics of the formation of a bond must